

**AMENDMENTS TO THE CLAIMS**

1. (Previously presented) A method of fabricating a diffractive optical element (DOE), the method comprising reactive ion etching a pattern in a ZnSc polycrystalline substrate by means of only chlorine-based gas which does not include a hydrocarbon group.
2. (Previously presented) A method of fabricating a Diffractive Optical Element (DOE), the method comprising reactive ion etching a pattern in a ZnSe polycrystalline substrate chlorine-based gas which does not include a hydrocarbon group and inert gas or gas which does not react with ZnSe.
3. (Previously presented) The method according to Claim 2, wherein said inert gas includes Ar.
4. (Previously presented) The method according to Claim 1, wherein said chlorine-based gas includes BC<sub>1</sub><sub>3</sub> gas.
5. (Previously presented) The method according to Claim 1, comprising reactive ion etching at a gas pressure of 0.5Pa through 1Pa.
6. (Previously presented) The method according to Claim 1, comprising activating the gas by means of a radio frequency.

7. (Previously presented) The method according to Claim 2, wherein said chlorine-based gas includes BC<sub>13</sub> gas.
8. (Previously presented) The method according to Claim 3, wherein said chlorine-based gas includes BC<sub>13</sub> gas.
9. (Previously presented) The method according to Claim 2 comprising reactive ion etching at a gas pressure of 0.5Pa through 1Pa.
10. (Previously presented) The method according to Claim 3 comprising reactive ion etching at a gas pressure of 0.5Pa through 1Pa.
11. (Previously presented) The method according to Claim 2 comprising activating the gas by means of a radio frequency.
12. (Previously presented) The method according to Claim 3 comprising activating the gas by means of a radio frequency.
13. (New) The method according to claim 1, comprising:  
synthesizing polycrystalline ZnSe from Zn and H<sub>2</sub>Se; and  
cutting the ZnSe polycrystalline substrate out of the synthesized polycrystalline ZnSe,  
wherein the DOE is for a CO<sub>2</sub> gas laser.